Engineering | Lancaster University

TEST REPORT

FL76 Composite Cover
BS EN124 B125 Test

Document reference number - FIB-FL76-B125-13-11-17

Report by:

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Date test carried out:

13th November 2017

Customer name:

Fibrelite Composites Ltd.
Snaygill Industrial Estate,
Keighley Road,
Skipton,
North Yorkshire
BD23 2QR

Clarifying Statements:

1. The results reported have been performed in accordance with the test requirements agreed by the customer (Fibrelite Ltd.) and laid down in the new EN 124-1: 2015 standard along with the composite section EN 124-5.

2. This report does not include or imply any expert opinions as to the serviceability of the sample tested or their suitability for a specific purpose.

3. The submitter disclaims any liability of any kind for any damage whatsoever resulting from the use of either data in the files or the attached values of the test results reported.

4. The report may not be reproduced other than in full, except with the prior written consent of the Engineering Dept., Lancaster University.

5. All testing has been carried out in within the Engineering Department, Gillow Ave., Lancaster University, Bailrigg, Lancaster LA1 4YW.

6. This report applies only to those items and/or materials that have been tested and reported on herein. No inference shall be made to similar test items or materials/ samples.

Cover

The composite cover supplied is a square FL76 complete with aluminium frame. (Photo.1)

Cover No. : 8221DJ
Frame No. : no number

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Photo. 1

A 100mm x 100mm steel box section frame was placed around the aluminium frame to add support and as an added safety feature incase of failure.

Test Rig

The test rig consists of a 'giant mecanno' frame bolted to the floor and supporting the Enerpac 50 ton hydraulic cylinder.

The cover and frame was seated on steel channels with steel shims to pack and level.

In accordance with the FprEN124-1:2015 standard the load cell and test rig complies with EN ISO 7500-1:2004 minimum Class 3.

Test Rig ID: EG100TF
Load Cell ID:
Instron Calibration Certificate No. E225112816155035
System Class: 1

Calibration sticker (Photo.3)

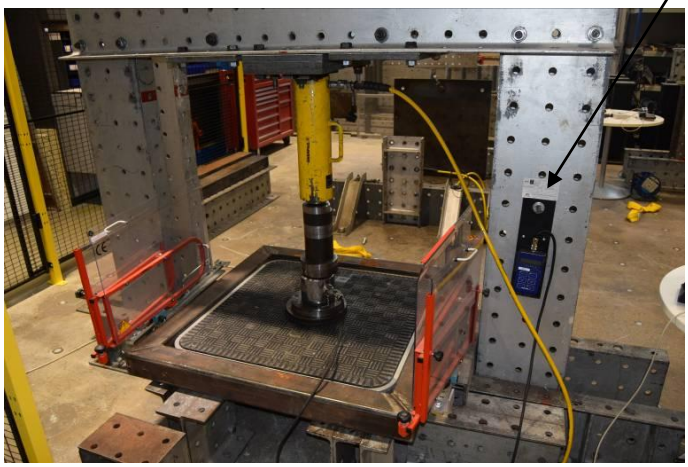


Photo.2

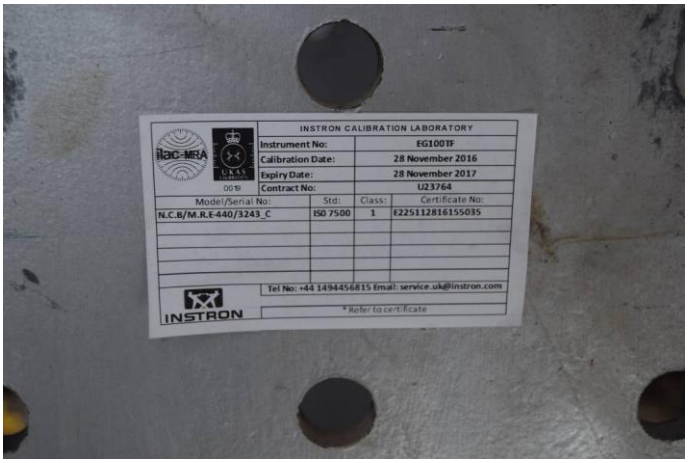


Photo.3

Test

The tests were carried out in accordance with the EN 124:2015 standard for:

- Permanent Set – Clause 8.2
- Load Bearing Capacity – Clause 8.3

The load was applied to the cover through a 250mm diameter by 45mm thick steel block with a 250mm diameter by 10mm rubber pad between the block and cover.

Permanent Set Test

Measurement of permanent set shall be made on the upper-side of the cover in the same place as the applied load at the longest dimension which can be inscribed within the cover through the centre point of the load application. The measurement device shall be positioned as close as possible to the centre point of the load application and the seating of the measuring device support as close as possible to the edge of the cover but not exceeding 10mm from the edge.

An initial reading is to be taken at the geometric centre of the cover before the first load or any preloading has taken place.

The load is then to be applied at a rate of 1kN/s to 5kN/s up to 2/3 of the test load. This procedure is to be carried out five times without significant disruption.

A final deflection reading shall then be taken and the permanent set determined as the difference of the measured readings between the first and fifth readings.

Load Bearing Capacity

Immediately after the permanent set test the cover shall be loaded up to the test load at a rate of 1kN/s to 5kN/s.

The test load shall then be maintained for 30^{+2}_{-0} seconds.

Results

Permanent set test

Photograph 3 below shows the initial reading being taken for the permanent set test.

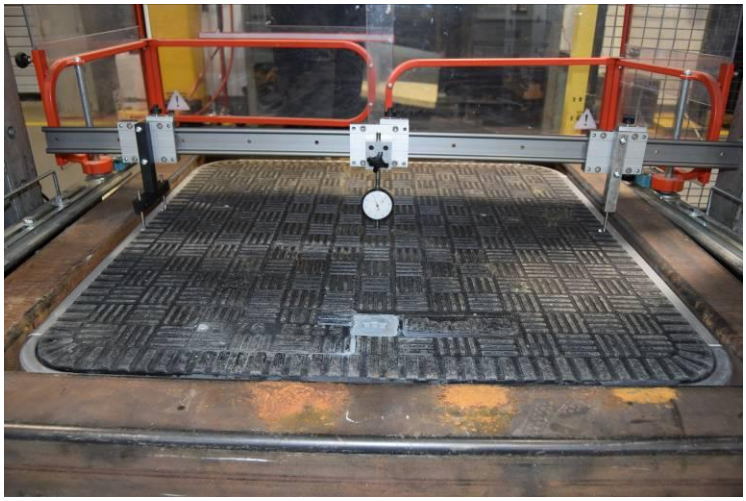


Photo.3

Initial Reading	0.00mm
Reading after 5 cycles	0.04mm
Permanent Set	**0.04mm**

Permissible permanent set for a B125 test is $\frac{CO}{100}$ = 760/100 = 7.60mm

Therefore cover passes the permanent set test.

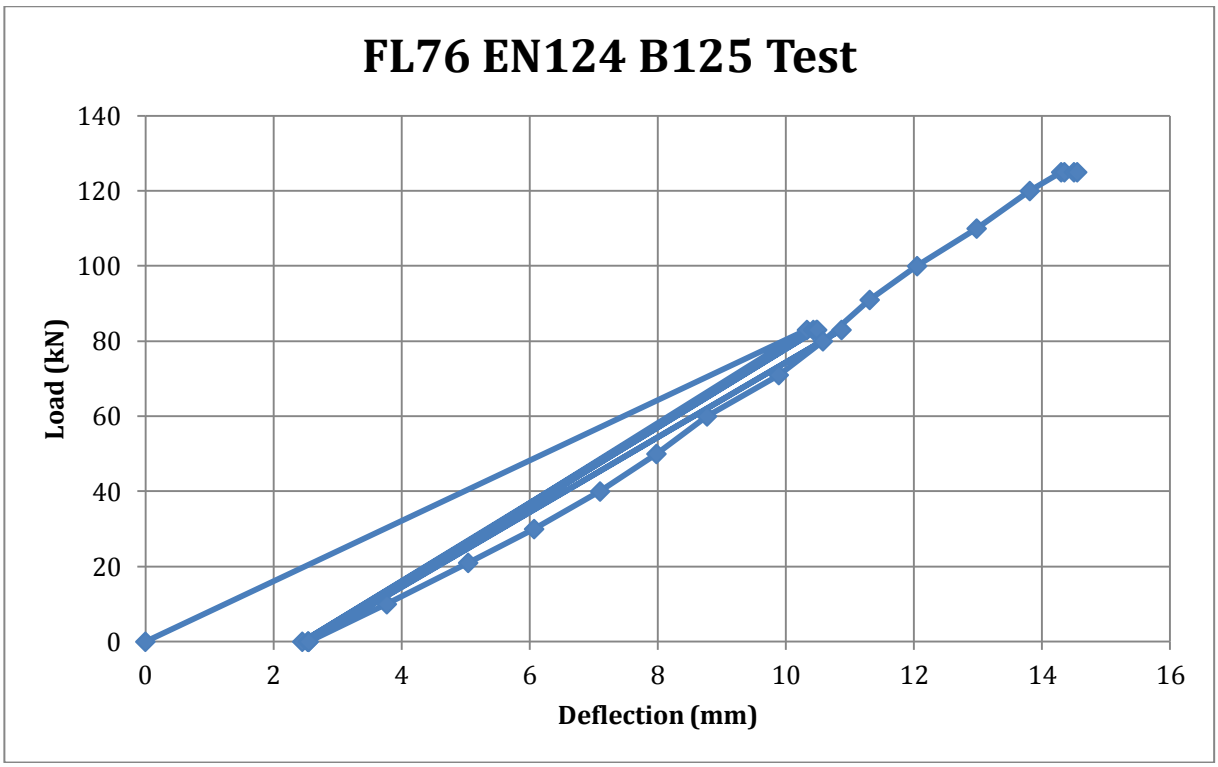
Load Bearing Capacity Test

Load applied immediately after the permanent set test.

Although the standard does not require it for the load bearing test, a measuring device (linear potentiometer) was placed on the underside of the panel directly under the loading point and deflection readings taken every 83kN for the five cycles and 10kN intervals after that.

LOAD (kN)	DEFLECTION (mm)	REMARKS
0	0.00	
83	10.33	
0	2.54	
83	10.43	
0	2.45	
83	10.48	
0	2.54	
83	10.49	
0	2.54	
83	10.87	
0	2.55	
10	3.77	
21	5.04	
30	6.07	
40	7.10	
50	7.98	
60	8.77	
71	9.89	
80	10.58	
91	11.31	
100	12.05	
110	12.98	
120	13.81	
125	14.30	
125 (10 seconds)	14.35	
125 (20 seconds)	14.50	
125 (30 seconds)	14.55	**PASS**
0	2.79	
214	Gauge removed	Ultimate failure – loud bang and load dropping off.

The cover held the test load of 125kN for the required 30 seconds so therefore passed the load bearing test.



The slightly large zero reading of 2.54mm after the first $\frac{2}{3}rds$ cycle was mainly due to the cover bedding into the frame.

After the cover had passed the EN124 B125 load bearing test the linear potentiometer was removed from under the cover to avoid damage.

The cover was then reloaded until ultimate failure occurred at 214kN.